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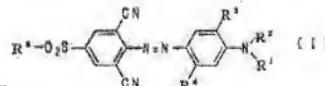
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(54) HEAT-SENSITIVE TRANSFER DYE, HEAT-SENSITIVE TRANSFER INK USING THE SAME, AND HEAT-SENSITIVE TRANSFER SHEET

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a heat-sensitive transfer dye suitable for use in a heat-sensitive transfer by sufficiently satisfying various conditions in a sublimation transfer method as a heat-sensitive transfer method, or particularly exhibiting an excellent cyan color and having excellent light resistance as well as a heat-sensitive transfer ink using the same and a heat-sensitive transfer sheet.

SOLUTION: The heat-sensitive transfer dye comprises an azo compound represented by formula (1). The heat-sensitive transfer ink comprises the heat-sensitive transfer dye, a bonding material and an organic solvent. The heat-sensitive transfer sheet comprises the heat-sensitive transfer dye, and a coloring material layer containing the binding material on a support.



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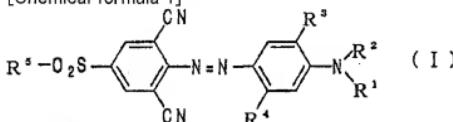
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CLAIMS

[Claim(s)]

[Claim 1]A pigment for thermal ink transfer printing consisting of an azo compound expressed with following general formula (I).

[Chemical formula 1]

[type (I) Naka, R¹, and R², An alkenyl group which may have independently an alkyl group which may have a substituent, and a substituent, respectively, A cycloalkyl group which may have a substituent, an aryl group which may have a substituent, Or, [whether a hydrogen atom is shown, when it is an alkyl group or an alkenyl group, R¹ and R² connect, and monocyclic heterocycle is formed, and] Or may form the benzene ring and condensed multi-ring type heterocycle which R¹ or R² adjoins, and R³, An alkyl group which may have a substituent, an alkoxy group which may have a substituent, a halogen atom, or a hydrogen atom is shown, and R⁴, An alkyl group which may have a substituent, an alkoxy group which may have a substituent, An aryloxy group which may have a substituent, the acylamino group which may have a substituent, An alkoxy carbonyl amine group which may have a substituent, an aryloxycarbonyl amine group which may have a substituent, a halogen atom, or a hydrogen atom is shown, and R⁵ shows a halogenation alkyl group.]

[Claim 2]The pigment for thermal ink transfer printing according to claim 1 whose R¹ and R² in said general formula (I) are both alkyl groups.

[Claim 3]The pigment for thermal ink transfer printing according to claim 1 or 2 whose R³ in said general formula (I) is an alkoxy group and whose R⁴ is the acylamino group.

[Claim 4]The pigment for thermal ink transfer printing according to any one of claims 1 to 3 whose R⁵ in said general formula (I) is a perfluoroalkyl group.

[Claim 5]The pigment for thermal ink transfer printing according to any one of claims 1 to 4, a binding material, and thermal-ink-transfer-printing ink that contains an organic solvent and is characterized by things.

[Claim 6]A thermal-ink-transfer-printing sheet characterized by coming to form a coloring material layer containing the pigment for thermal ink transfer printing according to any one of claims 1 to 4, and a binding material on a base material.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]**[0001]**

[Field of the Invention]This invention relates to the pigment for thermal ink transfer printing, the thermal-ink-transfer-printing ink which used it, and a thermal-ink-transfer-printing sheet.

[0002]

[Description of the Prior Art]Although various systems, such as electrophotography, an ink jet, and thermal ink transfer printing, are examined as color recording technology in a printer, a copying machine, a facsimile, etc. and it is put in practical use from before, In inside, operation and maintenance of equipment are easy for a thermal-ink-transfer-printing system, and it is points, like equipment itself and its consumable goods are comparatively inexpensive, and there are, and it is compared with other systems, and serves as an advantageous situation.

[0003]The melting transferring system which heats the transfer sheet in which the coloring material layer which applies and dried thermally fusible ink was formed on the base material with a heat head to the thermal-ink-transfer-printing system, carries out melting of the ink to it, makes it weld on a recording body, and carries out transfer record. Although the transfer sheet in which the coloring material layer which applies and dried the ink containing heat transfer coloring matters was formed on the base material is heated with a heat head and there are sublimation and/or a sublimation transfer method which carries out thermal diffusion, makes it shift on a recording body, and carries out transfer record about the pigment. Since the latter sublimation transfer method can control the transfer amount of a pigment by changing the energy given to a heat head, gradation recording is easy for it, and it is especially made advantageous to the full color recording using yellow, magenta, and the three-primary-colors pigment of cyanogen.

[0004]On the other hand as a pigment in this sublimation transfer method, By the operating condition of a heat head, do not carry out a pyrolysis but easily ** Carry out [sublimation or] thermal diffusion, ** Present desirable hue on that a molar extinction coefficient is large and ** color reproduction, ** It is necessary to provide conditions, like there is no problem of stable being the thing, that ** ink-ized fitness is excellent, that ** composition is easy, ** safety-and-hygiene nature, and environmental pollution to heat, light, humidity, medicine, etc.

[0005]

[Problem to be solved by the invention]This invention fully satisfies said terms and conditions in the sublimation transfer method as the above-mentioned thermal-ink-transfer-printing system, It is suitable to use as an object for thermal ink transfer printing, assumes the especially outstanding cyan color, and aims at providing the pigment for thermal ink transfer printing which is excellent also in the lightfastness, the thermal-ink-transfer-printing ink using it, and a thermal-ink-transfer-printing sheet.

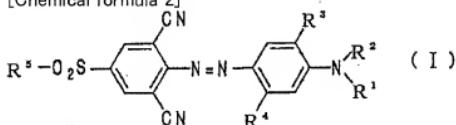
[0006]

[Means for solving problem]This invention makes a summary the pigment for thermal ink transfer

printing which consists of an azo compound expressed with following general formula (I).

[0007]

[Chemical formula 2]



[0008][type (I)] Naka, R¹, and R², The alkenyl group which may have independently the alkyl group which may have a substituent, and a substituent, respectively, The cycloalkyl group which may have a substituent, the aryl group which may have a substituent, Or. [whether a hydrogen atom is shown, when it is an alkyl group or an alkenyl group, R¹ and R² connect, and monocyclic heterocycle is formed, and] Or may form the benzene ring and condensed multi-ring type heterocycle which R¹ or R² adjoins, and R³, The alkyl group which may have a substituent, the alkoxy group which may have a substituent, a halogen atom, or a hydrogen atom is shown, and R⁴, The alkyl group which may have a substituent, the alkoxy group which may have a substituent, The aryloxy group which may have a substituent, the acylamino group which may have a substituent, The alkoxy carbonyl amine group which may have a substituent, the aryloxy carbonyl amine group which may have a substituent, a halogen atom, or a hydrogen atom is shown, and R⁵ shows a halogenation alkyl group.]

[0009]This invention makes a summary said pigment for thermal ink transfer printing, a binding material, and the thermal-ink-transfer-printing ink containing an organic solvent, and this invention makes a summary further the thermal-ink-transfer-printing sheet in which it comes to form the coloring material layer containing said pigment for thermal ink transfer printing, and a binding material on a base material.

[0010]

[Mode for carrying out the invention] The azo compound which is a pigment for thermal ink transfer printing of this invention, It is expressed with said general formula (I), and is formula (I) here. As an alkyl group of inner R¹ and R², A carbon number usually The straight chain shape of 1-10, or a branched state thing, for example, a methyl group, An ethyl group, a propyl group, a butyl group, a pentyl group, a hexyl group, a heptyl group, an octyl group, etc. are mentioned, and as an alkenyl group, The straight chain shape of 2-10 or a branched state thing, for example, a vinyl group, an allyl group, a propenyl group, a butenyl group, a pentenyl group, etc. are usually mentioned by the carbon number, and as a cycloalkyl group, A carbon number is usually mentioned for the thing of 4-7, for example, a cyclopentyl group, a cyclohexyl group, a cycloheptyl group, etc., and a phenyl group, a naphthyl group, etc. are mentioned as an aryl group, for example. It is [in / both / this invention] preferred that R¹ and R² are alkyl groups in inside.

[0011]As a substituent in those alkyl groups, an alkenyl group, a cycloalkyl group, and an aryl group, For example, a methyl group, an ethyl group, a propyl group, a butyl group, a pentyl group, Carbon numbers, such as a hexyl group, usually The alkyl group of 1-8, a methoxy group, an ethoxy basis, The carbon number of a propoxy group, a butoxy group, etc. usually The alkoxy group of 1-4, Acyl groups, such as an acetyl group, a propionyl group, a butyryl group, and benzoyl, Acyloxy groups, such as an acetoxy group, a propionyloxy group, a butyryloxy group, and a benzoyloxy group, A methoxycarbonyl group, an ethoxycarbonyl group, a carbopropoxy group, Alkoxy carbonyl groups, such as a butoxycarbonyl group and a hexyloxy carbonyl group, A methoxycarbonyloxy group, an ethoxycarbonyloxy group, a propoxycarbonyloxy group, Alkoxy carbonyloxy group, such as a butoxycarbonyloxy group and a hexyloxy carbonyloxy group, Heterocycle groups, such as aryloxy groups, such as aryl groups, such as alkenyloxy groups, such as an allyloxy group, and a phenyl

ethyl group,

group, an ethyl group,

group, and a phenoxy group, a furil group, a tetrahydro furil group, a pyranyl group, and a tetrahydropyranyl group, a carboxy group, a hydroxy group, an amino group, a nitro group. A cyano group, a halogen atom, etc. are mentioned and these may have a substituent further.

[0012]When R¹ and R² are an alkyl group or an alkenyl group, as monocyclic heterocycle connected and formed, For example, a pyrrole ring, a pyrroline ring, a pyrrolidine ring, a piperidine ring, etc., The morpholine ring which incorporated the oxygen atom, the sulfur atom, or the nitrogen atom, As the benzene ring to which a thia morpholine ring, a piperazine ring, etc. are mentioned and which R¹ or R² adjoins, and condensed multi-ring type heterocycle to form, an indoline ring, a tetrahydroquinoline ring, a JURORUJIN ring, etc. are mentioned, for example. As for such monocyclic heterocycles or condensed multi-ring type heterocycle, the carbon number may usually have substituents, such as an alkyl group of 1-4.

[0013]Said general formula (I) As the alkyl group of inner R³, alkoxy groups, and those substituents, the same thing is mentioned also in said R¹ and R². In this invention, it is preferred as R³ that it is an alkoxy group.

[0014]Said general formula (I) as the alkyl group of inner R⁴, an alkoxy group, and an aryloxy group. The same thing is mentioned also in said R¹ and R², and as an acylamino group, For example, a formylamino group, an acetylaminogroup, a propionylamino group, a butyrylaminogroup, a benzoylaminogroup, etc. are mentioned, and as an alkoxy carbonylaminogroup, For example, a methoxycarbonylaminogroup, an ethoxycarbonylaminogroup, A propoxy carbonylaminogroup, a butoxycarbonylaminogroup, a hexyloxy carbonylaminogroup, etc. are mentioned, and a phenoxy carbonylaminogroup etc. are mentioned as an aryloxycarbonylaminogroup, for example. In this invention, it is preferred as R⁴ that it is the acylamino group.

[0015]The thing same as a substituent in those alkyl groups, an alkoxy group, an aryloxy group, the acylamino group, an alkoxy carbonylaminogroup, and an aryloxycarbonylaminogroup as the substituent in said R¹ and R² is mentioned.

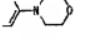
[0016]Said general formula (I) As a halogenation alkyl group of inner R⁵, the alkyl group of 1-12 is usually mentioned for the carbon number replaced with halogen atoms, such as a fluorine atom, a chlorine atom, and a bromine atom. In this invention, it is preferred that it is a perfluoroalkyl group and the carbon numbers of the alkyl group are 1-4 as R⁵.

[0017]As mentioned above, by describing each basis of R¹, R², R³, R⁴, and R⁵ in the following table shows below the example of an azo compound expressed with said general formula (I). Among front, "Ph" showed the phenyl group and indicated in front what forms the benzene ring which what R¹ and R² connect and forms monocyclic heterocycle, R¹, or R² adjoins, and condensed multi-ring type heterocycle with a part of the benzene ring.

[0018]

[Table 1]

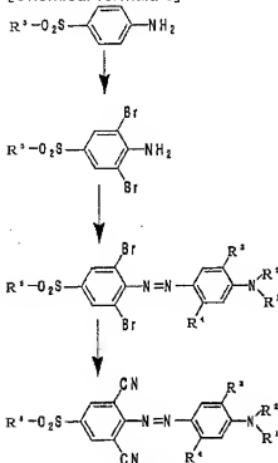
表 1

N o	R ¹	R ²	R ³	R ⁴	R ⁵
1	C ₂ H ₅	C ₂ H ₅	OCH ₃	NHCOCH ₃	C ₄ F ₉ (n)
2	C ₂ H ₅	C ₂ H ₅	H	NHCOCH ₃	C ₄ F ₉ (n)
3	C ₂ H ₁₇ (n)	C ₂ H ₁₇ (n)	OCH ₃	NHCOCH ₃	C ₄ F ₉ (n)
4	C ₄ H ₉ (n)	C ₂ H ₅	OCH ₃	NHCOCH ₃	C ₄ F ₉ (n)
5	CH ₂ CH ₂ OH	C ₂ H ₅	OCH ₃	NHCOCH ₃	C ₄ F ₉ (n)
6	CH ₂ CH ₂ CN	C ₂ H ₅	OCH ₃	NHCOCH ₃	C ₄ F ₉ (n)
7	CH ₂ CH ₂ Cl	C ₂ H ₅	OCH ₃	NHCOCH ₃	C ₄ F ₉ (n)
8	CH ₂ CH ₂ NH ₂	C ₂ H ₅	OCH ₃	NHCOCH ₃	C ₄ F ₉ (n)
9	CH ₂ -Ph	C ₂ H ₅	OCH ₃	NHCOCH ₃	C ₄ F ₉ (n)
1 0	CH ₂ CH ₂ OC ₄ H ₉ (n)	C ₂ H ₅	OCH ₃	NHCOCH ₃	C ₄ F ₉ (n)
1 1	(CH ₂ CH ₂ O) ₂ CH ₃	C ₂ H ₅	OCH ₃	NHCOCH ₃	C ₄ F ₉ (n)
1 2	CH ₂ CH ₂ OCOCH ₃	C ₂ H ₅	OCH ₃	NHCOCH ₃	C ₄ F ₉ (n)
1 3	CH ₂ CH ₂ COOC ₂ H ₅	C ₂ H ₅	OCH ₃	NHCOCH ₃	C ₄ F ₉ (n)
1 4	CH ₂ CH ₂ OOCOC ₂ H ₅	C ₂ H ₅	OCH ₃	NHCOCH ₃	C ₄ F ₉ (n)
1 5	CH ₂ - 	C ₂ H ₅	OCH ₃	NHCOCH ₃	C ₄ F ₉ (n)
1 6	Ph	C ₂ H ₅	OCH ₃	NHCOCH ₃	C ₄ F ₉ (n)
1 7		C ₂ H ₅	OCH ₃	NHCOCH ₃	C ₄ F ₉ (n)
1 8	CH=CH ₂	C ₂ H ₅	OCH ₃	NHCOCH ₃	C ₄ F ₉ (n)
1 9	CH ₂ CH=CH ₂	C ₂ H ₅	OCH ₃	NHCOCH ₃	C ₄ F ₉ (n)
2 0	C ₄ H ₉ (n)	C ₄ H ₉ (n)	H	NHCOCH ₃	CF ₃
2 1	C ₂ H ₅	C ₂ H ₅	OCH ₃	NHCOCH ₃	CF ₃
2 2	C ₂ H ₅	C ₂ H ₅	H	NHCOCH ₃	CF ₃
2 3			OCH ₃	NHCOCH ₃	C ₄ F ₉ (n)
2 4			CH ₃		C ₄ F ₉ (n)

[0019]The azo compound expressed with said general formula (I) is compoundable by the following route, for example.

[0020]

[Chemical formula 3]



[0021] Although the thermal-ink-transfer-printing ink of this invention can add said pigment for thermal ink transfer printing to the organic solvent as a medium at least and can prepare it by considering it as the coating liquid dissolved or distributed. Usually, apply this coating liquid, and it is made to dry on a base material, and sets to produce a thermal-ink-transfer-printing sheet, and the binding material for making this pigment for thermal ink transfer printing bind on a base material is added further, and thermal-ink-transfer-printing ink is prepared as coating liquid dissolved or distributed, a medium -- carrying out -- water other than an organic solvent may be used.

[0022] As the organic solvent, here, for example Methyl alcohol, ethyl alcohol, Alcohols, such as propyl alcohol and butyl alcohol, methyl cellosolve, Methyl-cellosolve acetate, ethylcellosolve, ethylcellosolve acetate, Ether, such as a tetrahydrofuran and 1,4-dioxane, methyl formate, Ester species, such as ethyl acetate and butyl acetate, acetone, methyl ethyl ketone, Aromatic hydrocarbon, such as ketone, such as cyclohexanone, benzene, toluene, xylene, and chlorobenzene. Chloroform, dichloromethane, 1,2-dichloroethane, 1,1,2-trichloroethane, 1,1,1-trichloroethane, tetrachloroethane, 1,2-dichloropropane, Chlorinated hydrocarbon, such as trichloroethylene, n-butylamine, isopropanolamine, Nitrogen-containing compounds, such as diethylamine, triethanolamine, ethylenediamine, and a triethylene diamine. Aprotic polar solvents, such as acetonitrile, N-methyl pyrrolidone, N,N-dimethylformamide, and dimethyl sulfoxide, are mentioned, and these use together independent or two sorts or more, and are used. These organic solvents are used in about 10 to 50-time quantity by a weight ratio to said pigment for thermal ink transfer printing.

[0023] As a binding material, for example Acrylic resin, styrene resin, polyester resin, Polycarbonate resin, polyamide resin, polysulfone resin, polyether sulfone resin, polyvinyl butyral resin, cellulose, casein, an epoxy resin, phenol resin, phenoxy resin, etc. are mentioned. These binding materials are used in the quantity of about 50~500 weight sections to said pigment 100 weight section for thermal ink transfer printing.

[0024] Additive agents usually used, such as the non-sublimability particles of further organicity or inorganic matter, an antioxidant, a spray for preventing static electricity, a dispersing agent, a

viscosity controlling agent, and a defoaming agent, may be added by thermal-ink-transfer-printing ink if needed.

[0025] And the thermal-ink-transfer-printing sheet in which the coloring material layer which said pigment for thermal ink transfer printing distributed in the binding material was formed on the base material is produced by applying said pigment for thermal ink transfer printing, an organic solvent, and said thermal-ink-transfer-printing ink that contains a binding material at least on a base material, and carrying out stoving.

[0026] As the base material, here, for example Tissue paper, such as a condenser paper and glassine, The film of heat-resistant plastics, such as polyester resin, polycarbonate resin, polyamide resin, polyimide resin, and polyaramide resin, etc. are mentioned, and the thickness as a base material is usually about 3-50 micrometers. In this invention, a polyethylene terephthalate resin film is preferred in inside.

[0027] As a coating method to said base material, a dipping method, a spray method, the bar coating-machine method, the blade method, the roll coater method, the wire bar method, the knife coating-machine method, etc. are mentioned, for example.

[0028] In the thermal-ink-transfer-printing sheet of this invention, the thickness after desiccation of the coloring material layer formed on a base material is about 0.1-5 micrometers. When a base material is a polyethylene terephthalate resin film as a thermal-ink-transfer-printing sheet, in order to give the heat-resistant slippage over a run of a heat head to this film, for example, For example, it is preferred that the heat-resistant slippage layer which made heat resistant resin contain lubricant etc. is formed in the field in which the coloring material layer was formed, and the field of an opposite hand.

[0029] Without applying on a base material, the thermal-ink-transfer-printing ink of the above this invention can be heated with a heater etc., and a pigment can also be used for it by sublimation and/or the method of carrying out thermal diffusion, making it shift on a recording body, and carrying out transfer record directly, and it can also make a binding material unnecessary as thermal-ink-transfer-printing ink in that case. The thermal-ink-transfer-printing sheet of the above this invention can also be used as a charge transfer sheet of energization printing by using the film which gave the function which can use not only a heat head but infrared rays, laser beams, etc., and generates heat by energization as a base material as a heating method.

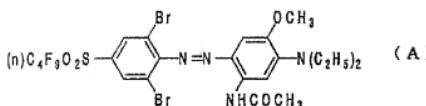
[0030]

[Working example] Hereafter, although an embodiment explains this invention still more concretely, this invention is not limited to the following embodiments, unless the summary is exceeded.

[0031] 4.7 g of the embodiment 14-perfluoro (n) butylsulfonyl aniline in 25 ml of acetic acid, By adding the sodium acetate 1.2g and 100 ml of water, and filtering and drying [rinse and] a precipitated crystal, after dropping the solution made to dissolve the bromine 4.2g in 10 ml of acetic acid, making it react under flowing back for 1 hour and making it cool to a room temperature, 6.35 g of the 2,6-dibromo-4-perfluoro (n) butylsulfonyl aniline is obtained, After diazotizing the 2.67 g with a conventional method with nitrosyl sulfuric acid, the resultant 3.2g of the following structure (A) was acquired by performing a coupling reaction at 5-10 ** in 1.18 g of 2-methoxy-5-acetylamo N,N-diethylaniline, and methanol. The 3.12 g and the cuprous cyanide 0.77g are made to react at 95-100 ** in 50 ml of N,N-dimethylformamide for 2 hours, After making 50 ** cool, the pigment 1.25g for thermal ink transfer printing shown in No.1 of said example as an azo compound was obtained by filtering, slushing filtrate into 100 ml of water, and filtering and drying [rinse and] a precipitated crystal. The obtained pigment has a peak of m/z=672 by measurement of a mass spectrum after refining with column chromatography, and has λ_{max} =630nm, molar extinction coefficient =110,000, and half breadth =59nm by measurement of the absorption spectrum in the inside of acetone.

[0032]

[Chemical formula 4]



[0033] Thermal-ink-transfer-printing ink was prepared by adding toluene / tetrahydrofuran partially aromatic solvent (weight ratio 1:1) 120 weight section, and processing pigment 3 obtained weight section and polyvinyl-butylal-resin ("BX-1" by Sekisui Chemical Co., Ltd.) 5 weight section as a binding material for 30 minutes with an ultrasonic washing machine.

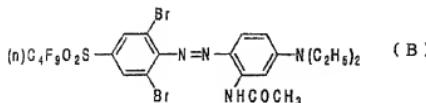
[0034] As a base material, then, acrylic resin ("BR-80" by Mitsubishi Rayon Co., Ltd.) 10 weight section, Amino modified silicone oil ("KF393" by Shin-Etsu Chemical Co., Ltd.) 1 weight section, And apply to one field coating liquid which consists of toluene 89 weight section, and a polyethylene terephthalate resin film (6 micrometers in thickness) in which a heat-resistant slippage layer about 1 micrometer thick was made to form by making it dry is used, By applying to a field of another side of the base material thermal-ink-transfer-printing ink prepared above using a wire bar, and drying it, said pigment for thermal ink transfer printing and a binding material were contained, and a thermal-ink-transfer-printing sheet in which a coloring material layer about 1 micrometer thick was formed was produced.

[0035] On the other hand, polyvinyl phenyl acetal resin 70 weight section, VCM/PVC / vinyl acetate / vinyl-acetal copolymerization resin (the "S lek A" by Sekisui Chemical Co., Ltd.) 30 weight section, Silicone varnish (60 weight % of solids concentration, and "TSR-160" by Toshiba Silicone) 30 weight section, Amino modified silicone oil ("KF393" by Shin-Etsu Chemical Co., Ltd.) 2.5 weight section, To hexamethylene di-isocyanate (75 weight % of solids concentration, and "MITEC NY-710A" by Mitsubishi Chemical) 15 weight section. Coating liquid which added toluene / methyl-ethyl-ketone partially aromatic solvent (weight ratio 1:1) 1200 weight section, By using, applying and drying a wire bar on a synthetic paper ("YUPOFPG150" by Oji-Yuka Synthetic Paper), and also heat-treating for 30 minutes at 80 ** in oven, Produce an image receiving body in which an image receiving layer about 5 micrometers thick was formed, and both are piled up so that an image receiving layer of the image receiving body and a coloring material layer of said thermal-ink-transfer-printing sheet may meet, Using a thermal head, 6 dots [mm] /and record electric power were carried out in 0.21W/dot, resistance welding time was 12 milliseconds, transfer recording processing of the storage density of horizontal scanning and vertical scanning was carried out, and recording material of a clear cyan color was obtained. It was 1.7 as a result of measuring the depth of shade of obtained recording material using a densitometer (made in Macbeth "TR-927"). When a radiationproofing test was carried out about obtained recording material using a xenon fadeometer (made by Suga Test Instruments Co., Ltd.), having good lightfastness was checked.

[0036] After diazotizing 2.67 g of the 2,6-dibromo-4-perfluoro (n) butylsulfonyl aniline obtained in embodiment 2 Embodiment 1 with a conventional method with nitrosyl sulfuric acid, By performing a coupling reaction at 5-10 ** in 1.03 g of 3-acetyl amino N,N-diethylaniline, and methanol, acquire the resultant 3.3g of the following structure (B), and The 3.0 g, The cuprous cyanide 0.77g is made to react at 95-100 ** in 50 ml of N,N-dimethylformamide for 2 hours, After making 50 ** cool, the pigment 1.75g for thermal ink transfer printing shown in No.2 of said example as an azo compound was obtained by filtering, slushing filtrate into 100 ml of water, and filtering and drying [rinse and] a precipitated crystal. The obtained pigment has a peak of m/z=642 by measurement of a mass spectrum after refining with column chromatography, and has $\lambda_{max} = 611\text{nm}$, molar extinction coefficient =90,000, and half breadth =69nm by measurement of the absorption spectrum in the inside of acetone.

[0037]

[Chemical formula 5]



[0038]Like Embodiment 1, the outside which used this pigment prepared thermal-ink-transfer-printing ink, and as a result of producing and carrying out transfer recording processing of the thermal-ink-transfer-printing sheet, it obtained the recording material of the clear cyan color of the depth of shade 1.8. When the radiationproofing test was carried out like Embodiment 1 about the obtained recording material, having good lightfastness was checked.

[0039]

[Effect of the Invention]According to this invention, the terms and conditions in the sublimation transfer method as a thermal-ink-transfer-printing system are fully satisfied, It is suitable to use as an object for thermal ink transfer printing, and can assume the especially outstanding cyan color, and the pigment for thermal ink transfer printing which is excellent also in the lightfastness, the thermal-ink-transfer-printing ink using it, and a thermal-ink-transfer-printing sheet can be provided.

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TECHNICAL FIELD

[Field of the Invention]This invention relates to the pigment for thermal ink transfer printing, the thermal-ink-transfer-printing ink which used it, and a thermal-ink-transfer-printing sheet.

[Translation done.]

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PRIOR ART

[Description of the Prior Art]Although various systems, such as electrophotography, an ink jet, and thermal ink transfer printing, are examined as color recording technology in a printer, a copying machine, a facsimile, etc. and it is put in practical use from before, In inside, operation and maintenance of equipment are easy for a thermal-ink-transfer-printing system, and it is points, like equipment itself and its consumable goods are comparatively inexpensive, and there are, and it is compared with other systems, and serves as an advantageous situation.

[0003]The melting transferring system which heats the transfer sheet in which the coloring material layer which applies and dried thermally fusible ink was formed on the base material with a heat head to the thermal-ink-transfer-printing system, carries out melting of the ink to it, makes it weld on a recording body, and carries out transfer record. Although the transfer sheet in which the coloring material layer which applies and dried the ink containing heat transfer coloring matters was formed on the base material is heated with a heat head and there are sublimation and/or a sublimation transfer method which carries out thermal diffusion, makes it shift on a recording body, and carries out transfer record about the pigment, Since the latter sublimation transfer method can control the transfer amount of a pigment by changing the energy given to a heat head, gradation recording is easy for it, and it is especially made advantageous to the full color recording using yellow, magenta, and the three-primary-colors pigment of cyanogen.

[0004]On the other hand as a pigment in this sublimation transfer method, By the operating condition of a heat head, do not carry out a pyrolysis but easily ** Carry out [sublimation or] thermal diffusion, ** Present desirable hue on that a molar extinction coefficient is large and ** color reproduction, ** It is necessary to provide conditions, like there is no problem of stable being the thing, that ** ink-ized fitness is excellent, that ** composition is easy, ** safety-and-hygiene nature, and environmental pollution to heat, light, humidity, medicine, etc.

[Translation done.]

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TECHNICAL PROBLEM

[Problem to be solved by the invention]This invention fully satisfies said terms and conditions in a sublimation transfer method as the above-mentioned thermal-ink-transfer-printing system, It is suitable to use as an object for thermal ink transfer printing, assumes an especially outstanding cyan color, and aims at providing a pigment for thermal ink transfer printing which is excellent also in the lightfastness, thermal-ink-transfer-printing ink using it, and a thermal-ink-transfer-printing sheet.

[Translation done.]